

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference Case 21722	FOR FURTHER ACTION See Form PCT/PEA/416	
International application No. PCT/EP2004/003110	International filing date (day/month/year) 24.03.2004	Priority date (day/month/year) 03.04.2003
International Patent Classification (IPC) or national classification and IPC A23L1/302, A23L1/303, A23L1/305, A23L1/30, A23L1/275, A23J1/14, A61K8/64		
Applicant DSM IP ASSETS B.V.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> sent to the applicant and to the International Bureau a total of 2 sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input checked="" type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand 29.10.2004	Date of completion of this report 04.03.2005	
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Smeets, D Telephone No. +49 89 2399-7492	



INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.
PCT/EP2004/003110

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
 - ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

Description, Pages

1-5 as originally filed

Claims, Numbers

1-12 received on 04.02.2005 with letter of 02.02.2005

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
 - ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):
 4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - ☐ the description, pages
 - ☐ the claims, Nos.
 - ☐ the drawings, sheets/figs
 - ☐ the sequence listing (*specify*):
 - ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-12
	No: Claims	
Inventive step (IS)	Yes: Claims	1-12
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-12
	No: Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

Box No. VI Certain documents cited

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

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Re Item VI

Certain documents cited

Certain published documents

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
EP1405572	07.04.2004	04.10.2002	04.10.2002

EP1405572 has a filing date prior to the priority date of the present application and could be relevant in some regional and/or national phases for the assessment of novelty.

Re Item V.

1. The following documents are referred to in this communication:

- D1 : DATABASE WPI Section Ch, Week 199515 Derwent Publications Ltd.,
London, GB; Class D13, AN 1995-113373; XP002287568 &
RU 2 017 434 C1 (GOLOVCHENKO V I) 15 August 1994 (1994-08-15)
D2 : US 4 892 727 A (GROLLIER JEAN-FRANCOIS) 9 January 1990 (1990-01-09)
D3 : WO 99/11143 A (BUTTIMER EILEEN TERESA ; CANDY MICHAEL JOHN
(GB); FITCHETT COLIN STANL) 11 March 1999 (1999-03-11)
D4 : KING J ET AL: "FUNCTIONAL PROPERTIES OF LUPIN PROTEIN ISOLATES
(LUPINUS ALBUS CV MULTOLUPA)" JOURNAL OF FOOD SCIENCE,
INSTITUTE OF FOOD TECHNOLOGISTS. CHICAGO, US, vol. 50, no. 1, 1985,
pages 82-87, XP002068531, ISSN: 0022-1147
D5 : EP 1 106 174 A (HOFFMANN LA ROCHE) 13 June 2001 (2001-06-13)

2 Novelty and Inventive Step (Articles 33(1), (2) and (3) PCT)

None of the cited prior art documents D1-D5 teaches or suggests using native cross-linked lupin protein to prepare formulations comprising fat-soluble active ingredients. The formulations according to claims on file exhibit increased stability. Thus, the subject-matter of independent claims 1, 9 and 10 is considered to be novel and inventive.

Claims 2-8, 11, 12 are dependent on claims 1 and 10 and as such also meet the

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requirements of the PCT with respect to novelty and inventive step.

Case 21722What is claimed is:

1. Stable powderous formulations comprising a fat-soluble active ingredient in a matrix of a native lupin protein composition wherein the protein is cross-linked.
2. Formulations according to claim 1, wherein the lupin protein composition is a lupin
5 protein isolate having a protein content of more than 90 wt.-%.
3. Formulations according to claim 1, wherein the lupin protein composition is a lupin protein concentrate having a protein content of about 60-90 wt.-%.
4. Formulations according to claim 1, wherein the lupin protein composition is a lupin protein flour having a protein content of about 40-60 wt.-%.
- 10 5. Formulations according to claim 1, comprising mixtures of native lupin protein compositions as defined in claims 2-4.
6. Formulations according to claim 1, wherein the fat-soluble active ingredient is vitamin A, D, E or K, or a carotenoid, or a polyunsaturated fatty acid, or esters thereof, or mixtures thereof.
- 15 7. Formulations according to claim 1, wherein the fat-soluble active ingredient is a plant or animal oil or fat, particularly sunflower oil, palm oil or corn oil.
8. Formulations according to claim 1, comprising additionally a reducing sugar, particularly glucose, fructose, or xylose.
9. Food, beverages, animal feeds, cosmetics or drugs comprising a formulation according
20 to any one of claims 1 - 8.
10. Process for the preparation of formulations according to any one of claims 1 - 8, which comprises preparing an aqueous emulsion of the fat-soluble active ingredient and the native lupin protein composition, if desired, adding a reducing sugar, converting the

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emulsion into a dry powder, and submitting the dry powder to cross-linking the protein by heat treatment or by treatment with a cross-linking enzyme.

11. A process according to claim 10 wherein a reducing sugar is added and the composition is submitted to crosslinking by heating.
- 5 12. A process according to claim 10 wherein the composition is submitted to crosslinking by treatment with a cross-linking enzyme, particularly transglutaminase.
